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## CHAFFEE COUNTY RANGLANDS RESIDENT SURVEY – PRELIMINARY RESULTS

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### Introduction

Chaffee County is located in Colorado's central mountains, south of the I-70 and west of the I-25 development corridors. The headwaters of the Arkansas River as well as 15 of Colorado's 54 "fourteeners" (14,000 foot peaks) are found in the county. The mountain location and unique geographic features of Chaffee County make the area a prime location for tourism and outdoor recreation, particularly whitewater rafting, fishing, off-road vehicle (jeep and ATV) recreation, and hiking. Chaffee County hosts numerous visitors per year, primarily due to its vast outdoor recreation opportunities.

Historically, ranching and farming have been very important land uses in the county, with agricultural uses making up approximately 13 percent of total land use, and around 71 percent of private land use. Agricultural lands not only provide stimulus for the regional economy but also contribute to the local atmosphere and culture through the management of valley floor wildlife habitat and open working landscapes. Water quantity and quality are important issues for residents and tourists since many of the outdoor recreational opportunities are centered on the region's widely known water resources.

In recent years, the local population has been increasing, with an overall increase of 33 percent between 1990 and 2005 to reach an estimated resident popula-

tion of 16,879 (United States Bureau of the Census, 2007). This increase in population and increased interest in tourism in the area are likely to lead to future pressures to convert low density private lands, so largely agriculture and ranchlands, to higher density residential and tourism uses. Higher density land uses may provide more direct economic returns to the local economy. However, local residents and visitors may also value the preservation of the working landscapes provided by ranchlands in the area, potentially providing equivalent or higher indirect economic returns to the local economy. In addition, local land use and water quality are potentially linked. The exact trade-off in water quality between residential and agricultural uses, however, is not clear and may depend on the extent and type of land use. For example, high intensity residential development may increase runoff into streams due to additional paving. The impact of maintaining agricultural working landscapes may vary based on the type of use. For example, if the area is used for high intensity livestock production or cropping, water quality could decline because of additional pollutants in runoff that eventually reach the water source. Less intensive agricultural development, however, might lead to a lower level of water pollution than if the land were converted to urban uses.

In general, the conversion of Chaffee County's private open lands to higher density residential and commercial development may create some types of economic

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activity, but may also supplant other sources of social and economic well being due to the effect on the visual attributes of the rural landscape, cultural effects due to a changing economic base, and water quantity and quality effects on outdoor recreation opportunities. Based on these potential conflicting land uses, information on the value of open space (specifically working landscapes such as farms and ranchland) and water quality to local residents is useful for policy makers in determining if policies protecting open space and water quality will be beneficial. It can also help policy makers to examine the potential trade-offs between agricultural land uses and higher density land uses. This research has used non-market valuation techniques in a survey of local residents of Chaffee County to determine how local residents value working ranchlands and water quality in the county. This report provides preliminary results of the survey conducted in the spring of 2007. The next section discusses the survey and response rate, and the following section discusses the survey results.

### Resident Survey

The opinion of residents about the protection of working landscapes is important since potential ballot measures related to open-space preservation in the area may be voted on by area residents. The sample population for the resident survey was randomly selected from voter registration rolls for Chaffee County. Although the results for the survey can only be generalized to the voter population (as opposed to the general resident population) of Chaffee County, we feel that this target population is relevant for this analysis since open space preservation and water quality are public policy issues that may at some time be voted on by referendum.

A combination mail/Internet survey of residents was administered in March and April 2007. Respondents were mailed a survey, a stamped and addressed envelope, and a cover letter describing the project and the importance of their responses. The cover letter also explained that an Internet version of the survey was available if they preferred this method and listed the link to the survey address. The Internet survey was added in order to provide another response option for residents that may find this method more convenient.

The questionnaire was sent to a total of 1,350 individuals randomly selected from the voter registration list and representing approximately 13 percent of registered voters in the county. Eighty-one surveys were returned as undeliverable, leaving a total of 1,269 surveys that were received by residents. A total of 638 surveys were returned, for an overall response rate of 50.3 percent. Most surveys were returned by mail, with only 13 respondents choosing to fill out the survey on the Internet.

Different communities in Chaffee County were represented in the sample based on the percentage of total county population living in each area, essentially stratifying the county into two sub-regions known locally as “up valley” and “down valley.” Table 1 shows the response rate for each community in Chaffee County included in the survey. Response rates for Salida, Buena Vista and Nathrop were all near the overall response rate of 50 percent, while the response rate for Poncha Springs was slightly lower at 33 percent. All surveys sent to residents living in Granite were returned as undeliverable, and no responses were received from the surveys sent to residents of Monarch.

**Table 1. Response Rate by Location**

Community	Surveys Sent	Undeliverable	Surveys Returned	Response Rate
Salida	684	34	322	50%
Buena Vista	511	30	254	53%
Nathrop	95	13	43	52%
Poncha Springs	56	1	18	33%
Monarch	2	1	0	0%
Granite	2	2	0	-

## Survey Results

### *Demographics*

Several demographic variables were collected on the survey including employment status, gender, age, education and income. The respondents tended to be somewhat older on average (58 years) than the median age of all county residents (42 years). However, it would be expected that the average age of survey respondents would be somewhat higher since the average county age includes residents under the age of 18, who were not included in the sample since they are not permitted to vote. A slightly higher percentage of males responded to the survey than females, with around 56 percent of total respondents being male and around 44 percent being female. Forty-seven percent of the population of Chaffee County is female (United States Bureau of the Census, 2000), indicating that females are slightly under-represented in the sample. Overall, the respondents tended to be highly educated, with 57 percent of the sample having a Bachelor's degree or higher. The proportion of the Chaffee County population with a Bachelor's degree or higher is only 24 percent according to data from the year 2000, thus the average education level of the survey respondents is higher than the county population as a whole.

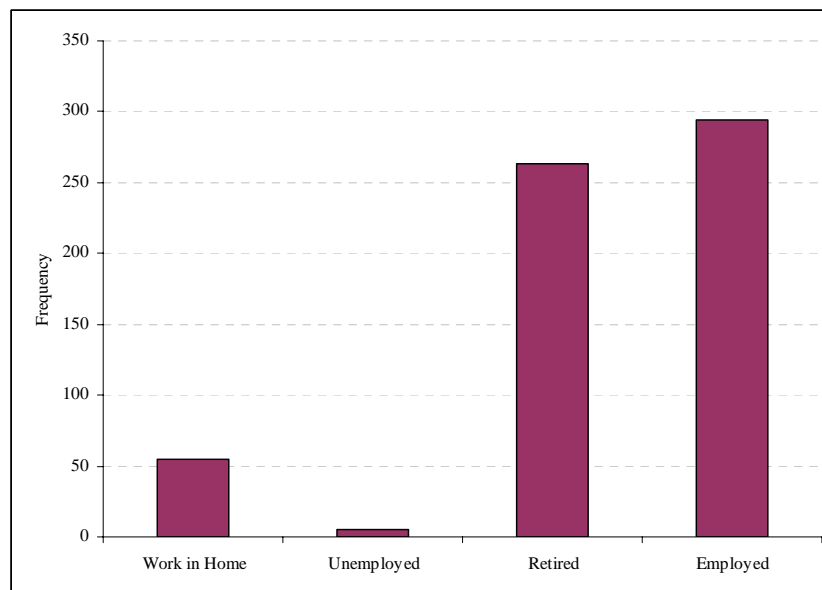
Most respondents were either employed or retired, with a slightly higher percentage of employed persons responding. Approximately 48 percent of the respondents were employed outside of the home, 43 percent were retired, 9 percent work in the home, and around 1 percent were unemployed (Figure 1). The largest category of respondent household income was between

\$40,000 and \$59,999 (Figure 2). This is slightly higher than the Chaffee County median household income level reported for 1999 of \$34,368, although it should be noted that this data is several years old and it is likely that the county median income level today would now fall into this range.

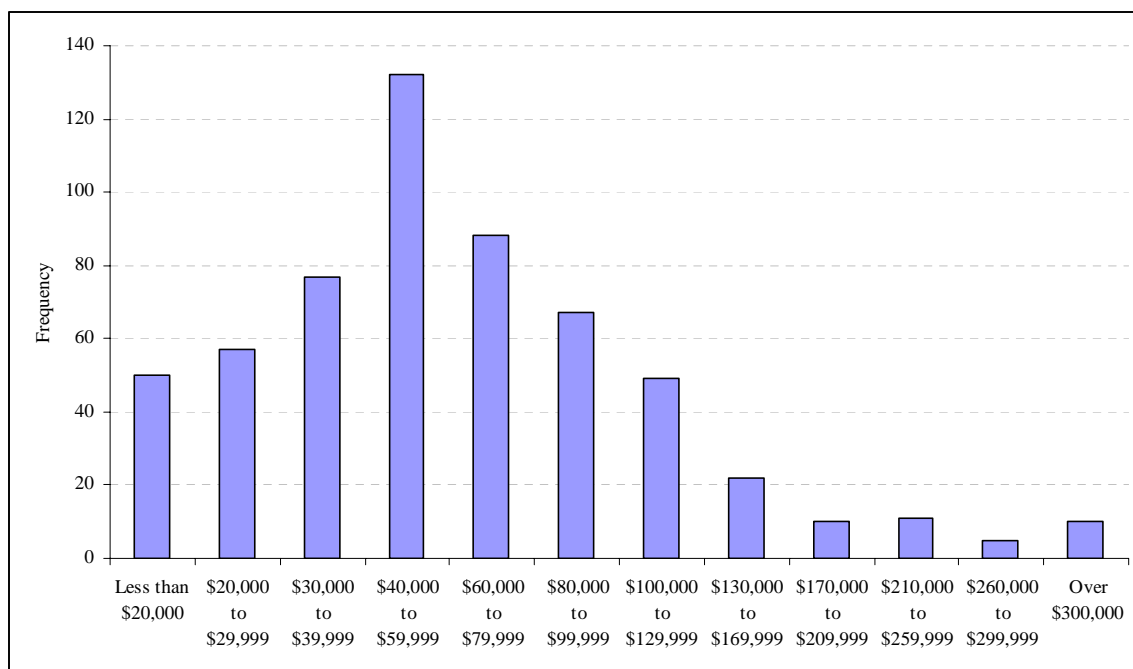
### *Household Variables*

Survey respondents tend to have lived in Chaffee County for a significant length of time, with the average respondent having lived in Chaffee County for around 19 years. Most respondents are full-time residents, with the average respondent living in Chaffee County 11.7 months out of the year. Since the survey sample consisted of registered voters in Chaffee County, it is not surprising that most respondents were full-time residents. The average household size of the sample was 2.2 persons, typical of the region and of US households. Most respondents live relatively close to ranchlands, with the average distance to the closest ranchland area being 1.8 miles (Table 2).

The vast majority of survey respondents own their home, with 92 percent owning and the remaining 8 percent renting their residences. Most respondents also live in residences with a rather small acreage of associated land, with 81 percent of respondents living on 5 acres of land or less. Only 4 percent of respondents live on more than 80 acres of land. Around one-third of households have a household member with a background in ranching or agriculture, while the remaining two-thirds do not.



**Figure 1. Employment Status of Survey Respondents**



**Figure 2. Income Level of Survey Respondents**

**Table 2. Summary of Selected Household Variables**

Variable	Observations	Mean	Standard		
			Deviation	Minimum	Maximum
Years living in Chaffee County	627	18.9	18.5	0.25	89
Months out of the year living in Chaffee County	608	11.7	1.4	0	12
Distance to the closest ranchland	588	1.8	2.1	0	20
Number of people living in household	628	2.2	1.0	0	6

#### *Issues and Attitudes*

Several questions that were meant to gather information on the importance of different issues to Chaffee County residents were included in the survey. The first of these questions asked respondents to prioritize which local issues that they felt were important in Chaffee County, or which issues deserved local attention. The residents were presented with a list of issues that encompassed natural resource management, local economic development, and quality of life. Respondents were asked to rank each possibility on a 5-point scale, with 5 being

very important and 1 being not at all important. Many of the issues presented were listed as very important by the largest percentage of respondents. The issues with the largest percentage of individuals rating them as very important are water quality (92.7 percent), water quantity (89.7 percent), local education (76.2 percent), open landscapes (72.2 percent), and employment opportunities (70.6 percent) (Table 3). Several other natural resource management issues ranked high in terms of importance including forestry management with 67.5 percent of respondents ranking it very important, public lands

**Table 3. Importance of Different Issues in Chaffee County (% of Total Responses)**

	<b>5 Very Important</b>	<b>4 Somewhat Important</b>	<b>3 Neutral</b>	<b>2 Not Important</b>	<b>1 Not at all Important</b>	<b>0 Not Sure</b>
Agricultural profitability	<b>57.69</b>	29.17	9.13	1.60	0.80	1.60
Tourism development	<b>36.03</b>	35.38	14.70	8.24	4.85	0.81
Second home development	7.94	19.61	<b>28.53</b>	23.66	18.8	1.46
Mining, oil & gas development	10.74	19.23	<b>28.21</b>	19.23	19.87	2.72
Forestry management	<b>67.52</b>	25.12	4.96	1.76	0.48	0.16
Public lands management	<b>67.15</b>	25.44	5.31	0.97	0.97	0.16
Rural lifestyle	<b>64.15</b>	22.99	10.45	1.61	0.48	0.32
Open landscapes	<b>72.23</b>	17.50	6.90	2.25	0.80	0.32
Water quantity	<b>89.74</b>	8.49	1.12	0.16	0.00	0.48
Water quality	<b>92.66</b>	5.58	1.44	0.16	0.00	0.16
Wildlife (not fish)	<b>62.72</b>	28.48	7.04	0.80	0.64	0.32
Fish	<b>55.06</b>	30.82	11.56	1.44	0.64	0.48
Outdoor recreational opportunities	<b>56.59</b>	31.35	9.00	1.45	1.29	0.32
Indoor recreational & cultural opportunities	26.72	<b>44.00</b>	20.64	5.92	2.24	0.48
Employment opportunities	<b>70.61</b>	20.13	7.19	1.28	0.48	0.32
Local education	<b>76.24</b>	15.95	6.22	1.12	0.16	0.32
Local infrastructure (e.g, roads, internet)	<b>57.58</b>	34.13	6.22	0.80	0.48	0.80

management with 67.2 percent, and wildlife with 62.7 percent. Several other issues were ranked as very important by the majority of respondents including agricultural profitability (57.7 percent), fish (55.1 percent), outdoor recreation (56.6 percent), and local infrastructure (57.6 percent). Tourism development was ranked as very important by the largest percentage of respondents (36 percent), although more people ranked this issue as lower importance than many of the other issues.

Some issues were ranked with a lower level of importance by the majority of respondents. Second home development and mining, oil and gas development were both ranked at a neutral level of importance by the

majority of respondents. In addition, a large percentage of respondents ranked these issues as not important or not at all important. Indoor recreation opportunities were also ranked lower than many other issues, with 44 percent of total respondents ranking this issue as somewhat important.

Residents were also asked to rank how the same issues contribute to their quality of life in Chaffee County. Each issue was ranked on a 5-point scale, with 5 being strongly contributes and 1 being strongly detracts. The factors that were ranked as most strongly contributing to the quality of life by respondents were water quality (with 78.8 percent choosing strongly contributes), water quantity (75.4 percent) and open landscapes (63.7

percent) (Table 4). Respondents also indicated that the rural lifestyle and outdoor opportunities in Chaffee County were important factors in their quality of life (56.5 and 54.1 percent of respondents ranked these factors as strongly contributing to their quality of life). Factors that were shown to have a weaker contribution to the quality of life for the majority of respondents were agricultural profitability, tourism development, and indoor recreation opportunities, with the largest percentage of respondents choosing contributes for each of these three factors. Second home development and mining were ranked as neutral by the largest proportion of responding residents. A large proportion of individuals indicated that these variables detracted from their living enjoyment, with 43.6 percent of respondents choosing detract or strongly detracts for second home

development, and 39 percent for mining, oil and gas development.

The survey also asked several questions related to respondents' attitudes about property ownership. Residents were presented with several statements about property ownership and asked to respond with the extent to which they agreed or disagreed with each statement. The first two statements dealt with freedom for property owners to do what they wish with their land. While the largest percentage of respondents disagreed with the statement that a property owner should be free to do as (s)he chooses with his (her) land, responses were fairly split among the responses, with 40 percent saying strongly agree or agree and 48 percent saying strongly disagree or disagree (Table 5). A

**Table 4. Contribution of Different Factors to Living Enjoyment (% of Total Responses)**

	<b>5 Strongly contributes</b>	<b>4 Contributes</b>	<b>3 Neutral</b>	<b>2 Detracts</b>	<b>1 Strongly detracts</b>	<b>0 Not Sure</b>
Agricultural profitability	25.76	<b>40.74</b>	29.63	1.93	0.32	1.61
Tourism development	17.95	<b>37.82</b>	21.79	15.06	6.73	0.64
Second home development	7.19	13.07	<b>34.64</b>	26.47	17.16	1.47
Mining, oil & gas development	5.81	12.90	<b>39.52</b>	19.68	19.35	2.74
Forestry management	<b>42.97</b>	41.67	11.60	1.47	1.31	0.98
Public lands management	<b>45.18</b>	39.87	10.61	2.09	1.13	1.13
Rural lifestyle	<b>56.47</b>	30.74	10.84	0.97	0.65	0.32
Open landscapes	<b>63.71</b>	27.42	7.26	0.48	0.65	0.48
Water quantity	<b>75.40</b>	17.36	5.63	1.13	0.00	0.48
Water quality	<b>78.75</b>	15.50	4.95	0.48	0.00	0.32
Wildlife (not fish)	<b>49.60</b>	36.07	11.59	1.77	0.48	0.48
Fish	<b>41.07</b>	36.69	20.78	0.81	0.00	0.65
Outdoor recreational opportunities	<b>54.08</b>	32.52	11.60	0.33	0.98	0.49
Indoor recreational & cultural opportunities	21.31	<b>41.83</b>	32.37	1.92	1.92	0.64
Employment opportunities	<b>39.26</b>	28.21	24.52	4.49	3.21	0.32
Local education	<b>47.11</b>	26.21	22.03	2.25	1.93	0.48
Local infrastructure (e.g, roads, internet)	<b>43.06</b>	38.06	13.55	3.71	0.97	0.65



**Table 5. Attitudes on Property Ownership**

	5 Strongly agree	4 Agree	3 Neutral	2 Disagree	1 Strongly disagree	0 Not Sure
I should be able to do anything I want to with my land	15.06	25.32	10.74	<b>35.42</b>	12.82	0.64
My neighbors should be able to do anything they want to with their land	13.71	24.35	10.32	<b>35.97</b>	14.84	0.81
My property values depend in part on my neighbor's property management	<b>49.44</b>	44.96	3.2	1.44	0.48	0.48
Neighbors need to consider each other's property values when managing their property	<b>51.43</b>	39.01	6.21	2.07	0.96	0.32

similar statement about the freedom of one's neighbors to do what they wish with their land had comparable answers, with 38 percent saying strongly agree or agree and 51 percent saying strongly disagree or disagree. Respondents tended to agree with the questions about their property values depending partly on their neighbor's property management and that neighbor's should consider each other's property values when managing their property, with over 90 percent of respondents agreeing with each of these statements. Another question asked whether the management of private land is a private or public matter. Half of all respondents felt that the management of private land was equally a public and private matter, while 39 percent felt that it was mostly a private matter.

Residents were also asked several questions related to their opinions about who should pay additional services and infrastructure costs of rural residential development. Most respondents agreed with the idea that developers should pay an impact fee to cover additional costs, with 72.8 percent strongly agreeing with the statement and 20.2 percent agreeing with the statement (Table 6). Although the response was not as favorable as that for development fees, respondents also tended to agree with the idea that landowners should pay a transaction fee to cover additional development costs, with nearly 55 percent choosing strongly agree or agree. Statements related to additional taxes or other payments by rural residents to pay for additional development costs had greater negative responses. The largest percentage of respondents (28.9 percent) disagreed with the statement that residents living further from town

should pay increased taxes or fees to cover the additional costs. Residents also were more likely to disagree with increased taxes, with 31 percent disagreeing with the imposition of additional sales taxes, and 32 percent strongly disagreeing with increased property taxes.

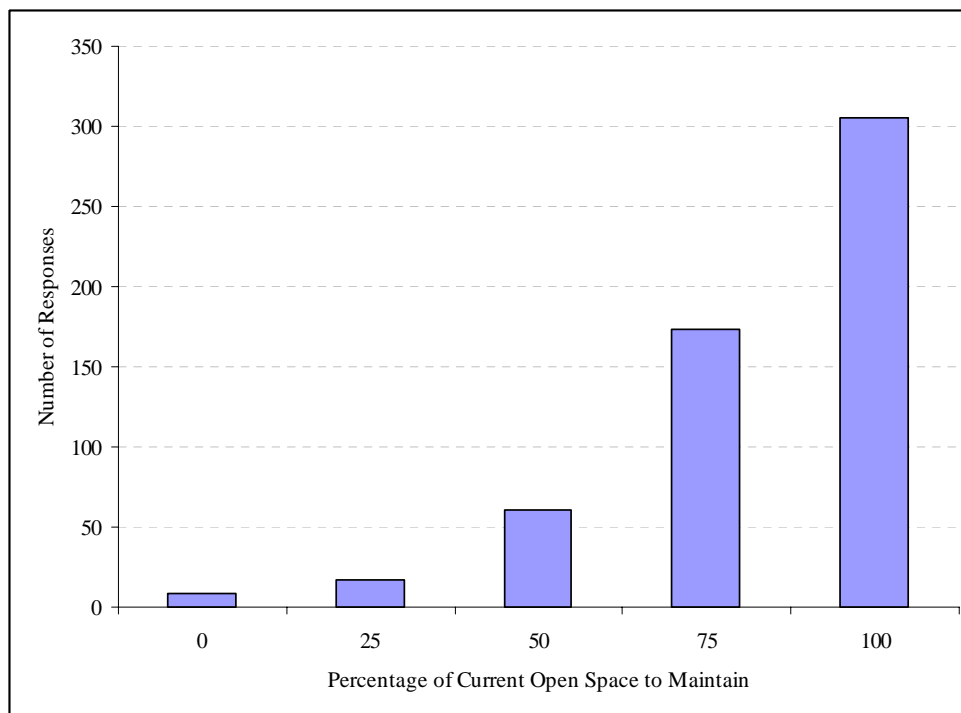
#### *Willingness to Pay*

In order to determine the value that residents of Chaffee County place on working landscapes and water quality in the area, a series of questions were included on the survey to determine the amount that individuals are willing to pay for these goods.

The first series of questions involved the value placed on working landscapes, which were defined in the questionnaire as "privately owned rural lands that include hay meadows and pastures, grazing cattle and horses, corrals and ranch buildings, working ranch hands and farm implements". After defining the concept of working landscapes, respondents were asked how much of the current amount of privately owned land in working landscapes they thought should be maintained, assuming that current levels of economic growth could be sustained from the development of other land. Respondents were asked to choose a percentage of the current acreage of privately owned working landscapes between 0 and 100 percent, in increments of 25 percent. Nearly 50 percent of respondents indicated that they would prefer for 100 percent of the current working landscape area to remain, while another 28 percent thought that 75 percent of the current area should be maintained (Figure 3). Ten percent of respondents thought that 50 percent should be

**Table 6. Cost Management of Rural Residential Development**

	5	4	3	2	1	0
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Not Sure
Developers pay an impact fee to cover additional costs	<b>72.76</b>	20.19	3.85	0.48	1.60	1.12
Landowners pay a transaction fee to cover additional costs	21.48	<b>33.28</b>	21.64	13.77	6.23	3.61
Rural residents living further from town pay increased taxes/fees to cover county costs	9.30	19.41	20.88	<b>28.87</b>	17.78	3.75
Increased sales taxes	5.37	17.24	18.86	<b>31.22</b>	24.55	2.76
Increased property taxes	2.94	13.70	19.58	29.20	<b>31.97</b>	2.61

**Figure 3. Survey Responses on the Percentage of Working Landscapes to be Maintained in Chaffee County**

maintained, 3 percent chose 25 percent, and 1 percent chose 0 percent. Around 9 percent of respondents were undecided about what percentage of working landscapes should be maintained.

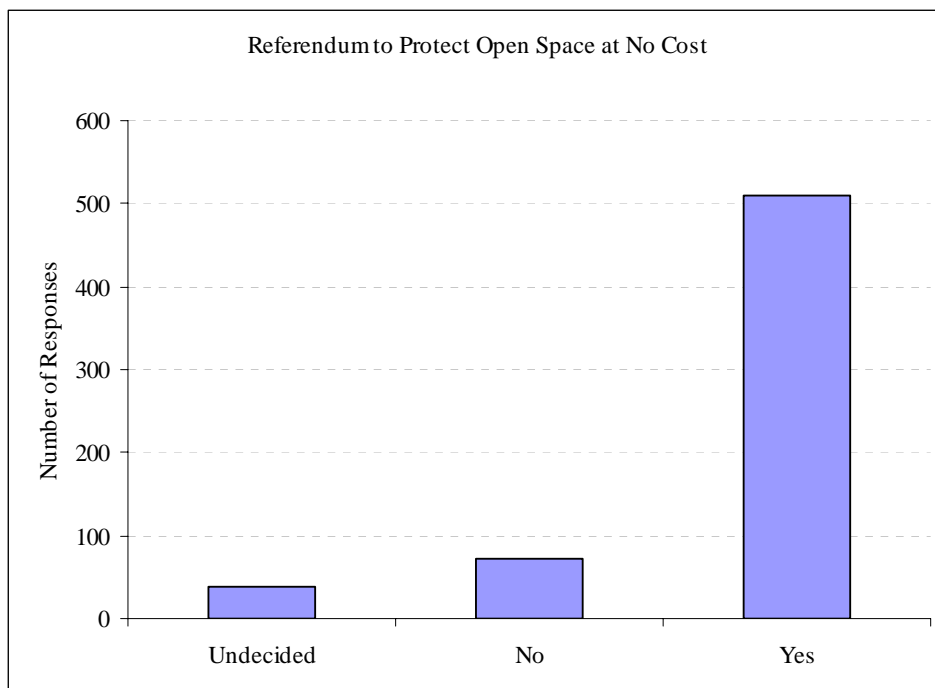
In order to determine how much respondents would be willing to pay to preserve working landscapes, a series

of questions were included on the survey. The first two questions asked if they would vote yes or no for a referendum that would guarantee the protection of privately owned open space. The first of these asked for a response if the referendum were to result in no additional cost to the respondent, while the second question framed the question with an additional cost to the

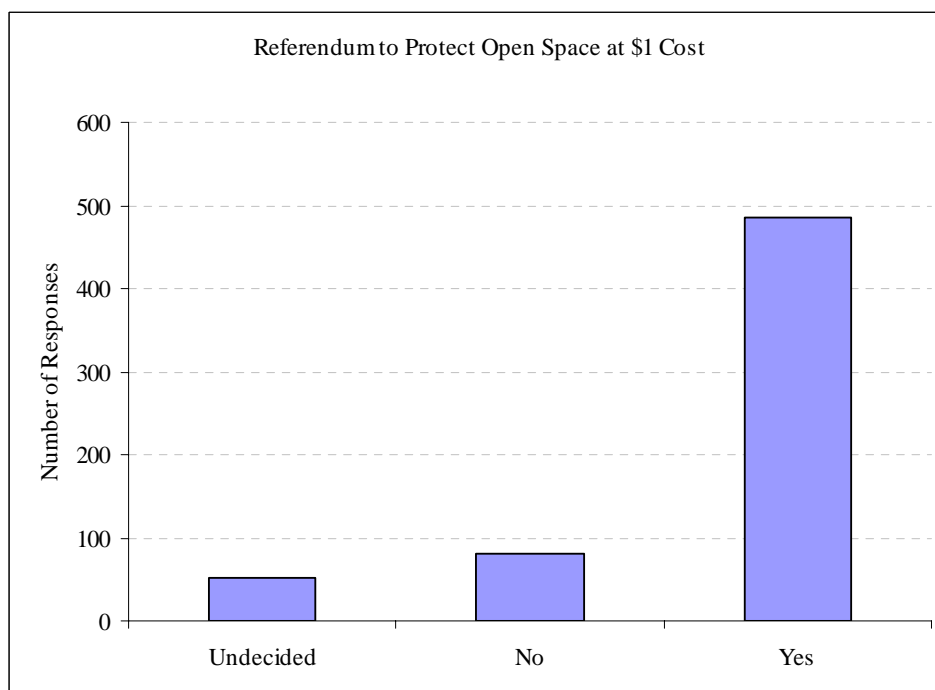


respondent of \$1. The majority of residents responding to the survey voted yes in both cases. In the case where a YES vote resulted in no additional costs to the respondent, 82 percent of respondents chose YES, while 12 percent chose NO, and around 6 percent were

undecided (Figure 4a). The case with an additional cost of \$1 had very similar results, with only slightly fewer respondents voting YES. In the second case 79 percent of respondents chose YES, 13 percent chose NO and 8 percent were undecided (Figure 4b).



**Figure 4a. Responses for a Referendum to Protect Open Space at No Cost**

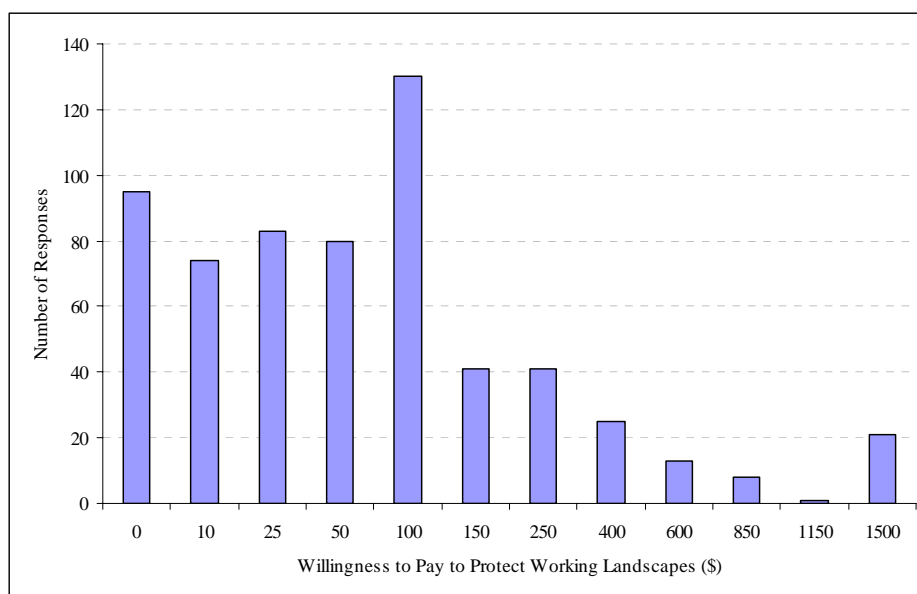


**Figure 4b. Responses for a Referendum to Protect Open Space at a Cost of \$1**

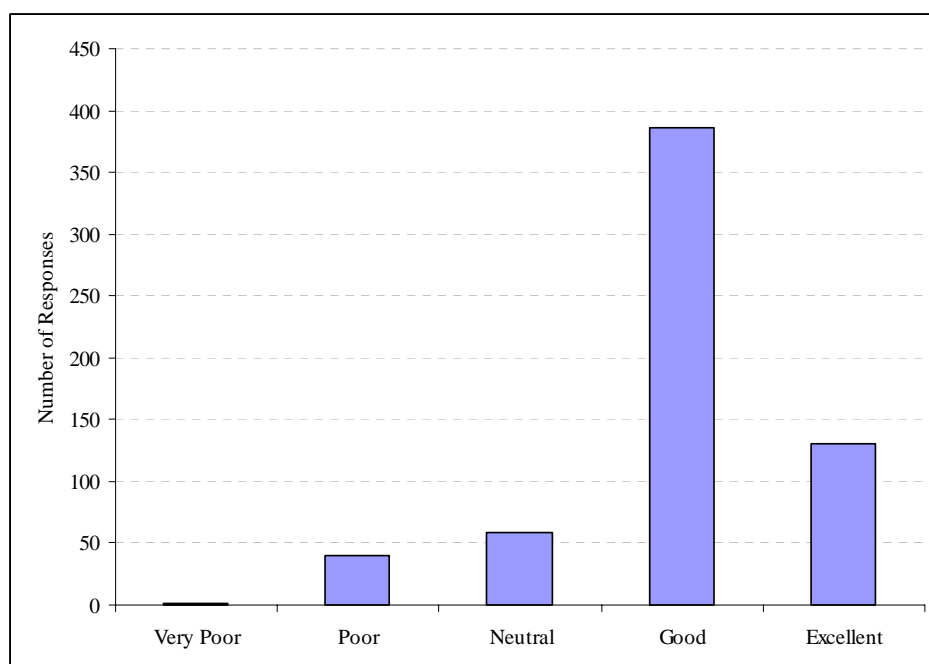
After the responses were collected about potential referenda for the protection of working landscapes, residents were asked about the maximum amount they would be willing to pay for the protection of working landscapes. The question asked the maximum that they would be willing to pay for the protection of working landscapes if the referendum resulted in an added cost to them annually for each of the next 5 years. Respondents were presented with 12 different dollar amounts and asked to choose the maximum value that they would be willing to pay. Figure 5 presents the 12 different values and the number of responses for each value. The most frequent

response category was \$100. The mean value of all responses for this question was \$152.70.

Several other questions were also asked to gauge the opinions of residents about water quality and their willingness to pay to maintain current levels of water quality in the Arkansas River in Chaffee County. The first question asked respondents to give their perception of the current level of water quality in Chaffee County. In general, most respondents perceived the water quality to be good, with around 83 percent of respondents rating the water quality as good or excellent (Figure 6).



**Figure 5. Willingness to Pay for Working Landscapes in Chaffee County**

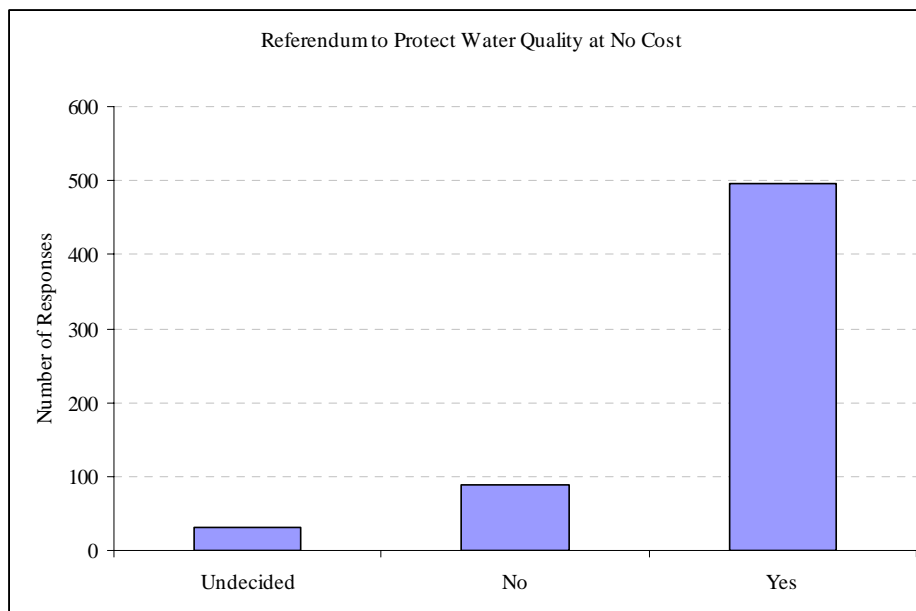


**Figure 6. Perception of Water Quality in Chaffee County**

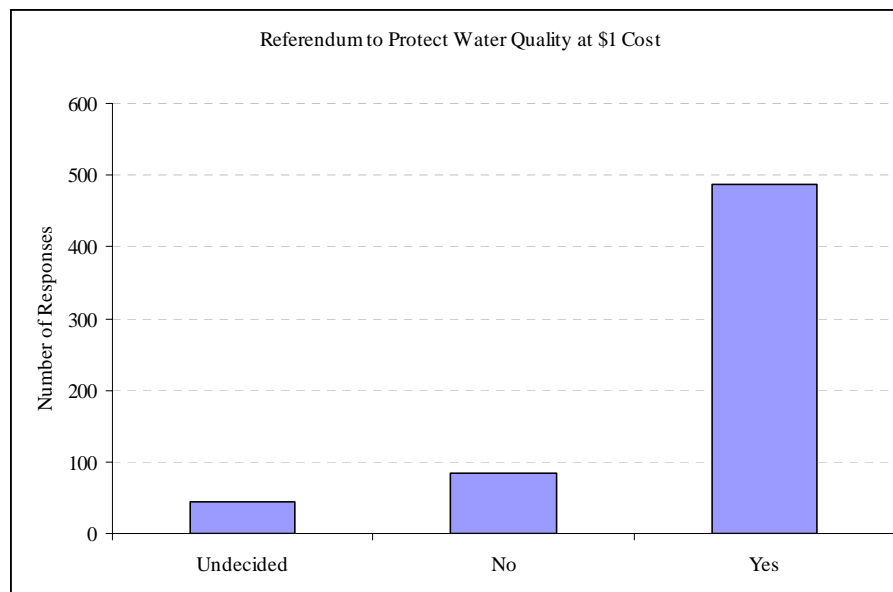
Approximately 9 percent of respondents had a neutral perception of local water quality, while only around 6 percent felt that water quality was poor or very poor.

The remaining questions related to water quality focused on the willingness to pay of individuals for additional funding for water quality protection in Chaffee County. This series of questions was also framed as a referendum. Respondents were asked if they would vote YES or NO for a referendum that would provide additional funding to protect water quality in Chaffee County, with a NO vote indicating that water quality

would remain at current levels. The first case asked for a YES or NO vote on the referendum if it would result in no additional costs for the citizens of Chaffee County. Approximately 81 percent of respondents answered YES to this question, 14 percent answered NO, and 5 percent were undecided (Figure 7a). A second question asked about the same referendum with an additional cost of \$1 to Chaffee County residents. Results for this question were very similar to those for the case with no additional cost. With an additional cost of \$1, 79 percent responded YES, 14 percent responded NO, and 7 percent were undecided (Figure 7b).



**Figure 7a. Responses for a Referendum to Protect Water Quality at No Cost**



**Figure 7b. Responses for a Referendum to Protect Water Quality at \$1 Cost**

Similar to the previous question about working landscapes, an additional question asked respondents the maximum that they would be willing to pay annually for 5 years to provide additional funding for water quality. Respondents were asked to choose from among 12 different choices between zero and \$1500. The maximum willingness to pay for water quality tended to be slightly lower on average than that for the preservation of working landscapes. The mean value for willingness to pay for water quality was \$113.5. The most frequent response categories were between zero and \$100, with \$10 chosen by the largest number of respondents (Figure 8).

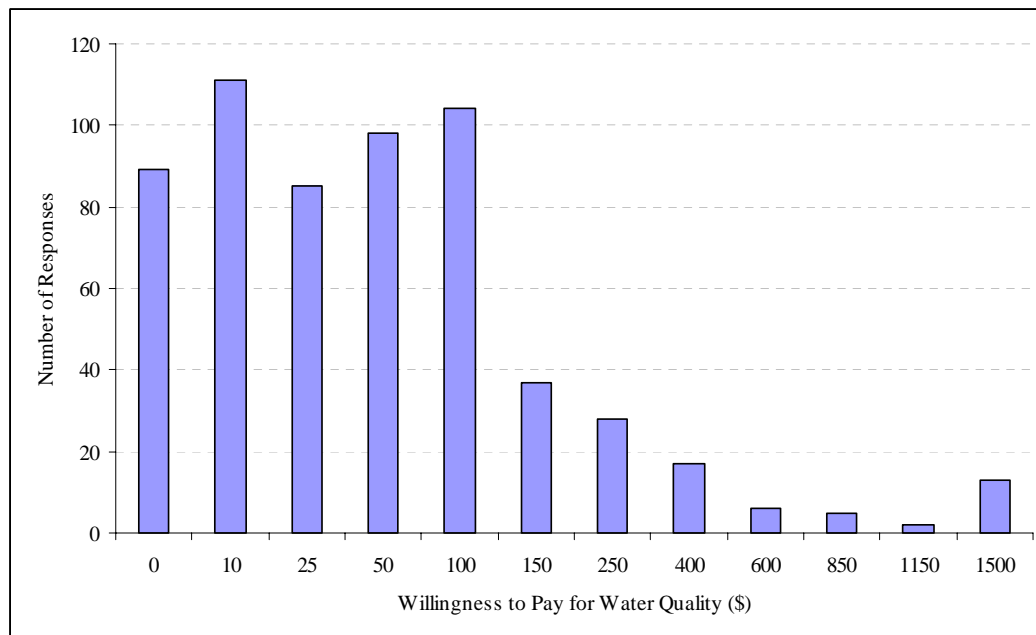
### Conclusions

Based on these preliminary results from this survey, it appears that the natural and traditional features of Chaffee County's geography are the most important features of the region to its current residents. It also appears that the residents of Chaffee County place a positive value on both ranchland open space and water quality and are willing to pay for their continued provision. Residents seemed very willing to support measures to protect working landscapes and water quality, with close to 80 percent of respondents indicating support for referenda on these measures.

The mean values obtained from the willingness to pay estimates indicate that residents place a slightly higher

value on privately-owned open space than water quality on average. The mean annual value that residents were willing to pay for working landscapes was slightly higher than that for water quality, with a mean value of \$153 for working landscapes and a mean value of \$114 for water quality protection. Extrapolated to the voting population, this yields an estimated willingness to pay of \$1,617, 516 for working landscape protection and \$1,205,208 for water quality preservation measures annually.<sup>2</sup> Taken to the level of the adult (over 18) resident population, to the extent that it is appropriate, yields annual willingness to pay values of \$2,118,438 for working landscapes and \$1,578,444.

The question of the preferred policy instrument to provide these important benefits is potentially more challenging. Moreover, this survey only includes the value that *residents* place on local water quality and working landscapes. We know that these are important features to the county's many visitors as well and while local businesses benefit from these tourists, it is likely that not all of the value they place on Chaffee's traditional and natural features currently are being captured. Consequently, the results of a companion survey of tourists conducted in the summer of 2007 addressing these same issues will provide a more complete picture of both the values that rural landscapes and high water quality generate for Chaffee County and the policy instruments available to capture some of these values.



**Figure 8. Willingness to Pay to Protect Water Quality in Chaffee County**

<sup>2</sup> Note that the survey question asked about the annual willingness to pay for 5 years, so this value would only be assumed to be accurate for 5 years from the date of the survey.

These additional results will provide complementary information that will help to determine policies that will best provide incentives for management to maintain these values in the future.

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